

ORACLES P3 Flight Scientist Post-Flight Status

Date: ____28 August 2017____

Flight number: ____PRF10____

Routine flight or target of opportunity? ____Routine____

If target of opportunity, what is the goal? _____

Flight scientist: ____Mike Poellot____

Assistant flight scientist: ____Art Sedlacek____

Take-off: ____080203____

Landing: ____170231____

Quick summary:

Representative ACAOD or ACAOD range for flight: ____max of
0.76_____

Do the models predict crossing a gradient in aerosol age?
Yes/No/Unclear No

Did the flight cross a gradient in macroscopic cloud properties, like cloud fraction?
Yes/No/Unclear Yes

Did the flight cross a gradient in aerosol loading?
Yes/No/Unclear

At any point during the flight, was there a clear separation between the smoke
plume(s) and cloud tops?
Yes/No/Unclear Yes, late in cloud work near south end

How many of the following maneuvers took place?

Ramps ____1____

Above cloud legs ____3____

Square spirals ____1____

Sawtooth legs ____2____

MBL legs ____1____

Plume legs ____2____

Cloud legs ____2____

Above plume legs ____1____

Instrument status:

Instrument	Comments
P3	All good
4STAR	OK
HiGEAR	Leak in SDI line did not affect uhsas measurements.
HiGEAR-AMS	Computer did not boot up
HSRL-2	Hsrl chiller problem towards the end. Was replaced after flight.
RSP	OK
APR3	OK
Cloud probes	OK, except CAPS hot wire needs replacing. 1 of 2 CDP still down Minor problem with serial data collection. Was being saved but not transmitted.
CCN	OK
PDI	Minor problem with serial data collection. Was being saved but not transmitted.
Vertical winds	OK
WISPR/CVI	Plumbing problem. Unclear about it.
COMA	Minor problem with the serial data collection similar to PDI

SSFR	OK
data	Serial data issue with several probes
filters	Never worked, linked to a leak in the SDI line, that was reduced by 10%

PRF10 28August 2017 day-of-week Mission Report

flight scientist: Mike Poellot/Art Sedlacek

ground scientist: Paquita Zuidema

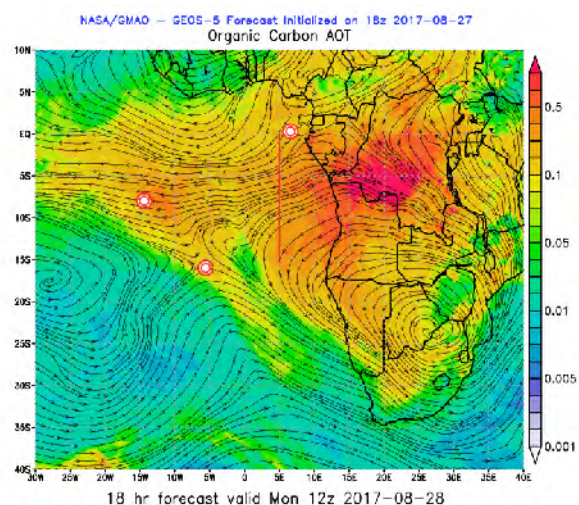
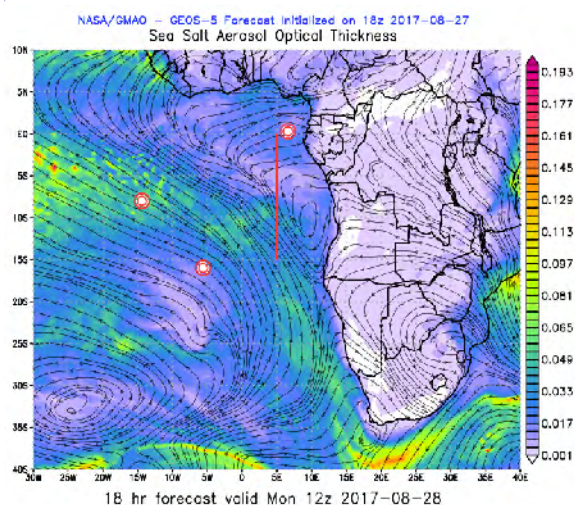
Flight Summary

Flight Objective: Fly routine flight track and IF there is no cirrus at ~ 11S, conduct a simplified radiation wall; conduct some cloud work; and finish with aerosol sampling.

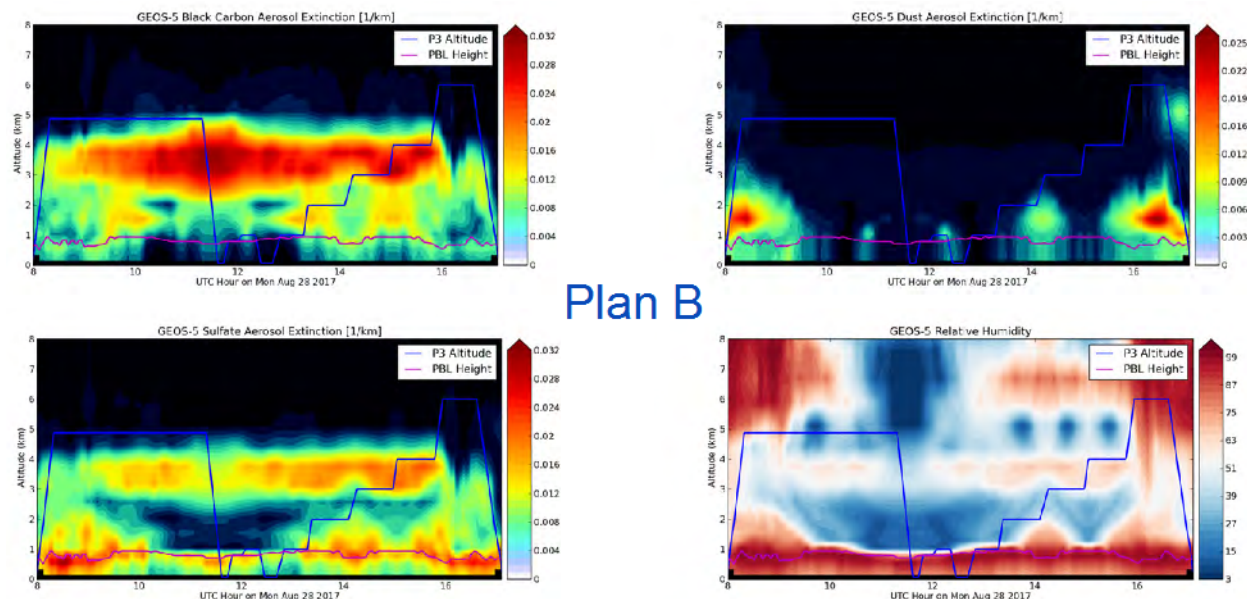
- 11S execute square spiral from 5800 m to 100 m
- Between 11S – 8S conduct cloud work [above/below/in/sawtooth]
- Climb to aerosol layer (4 km) at 10S and conduct stacked sampling (4 & 3 km)
- On transit to TMS, sample “lava lamp” structure.

A-Priori Forecast

Sea Salt AOT (left plot) and OA AOT (right plot). Routine flight track (5E – red line) superimposed.

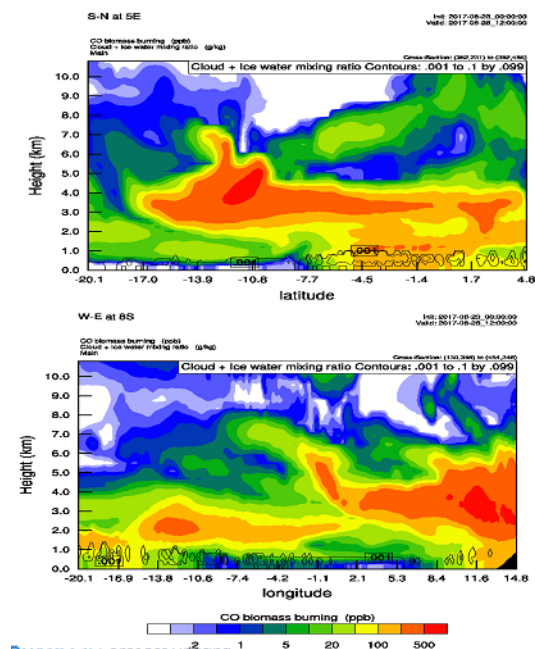


BC Ext. (top-left), Sulfate Ext. (bottom-left), dust Ext. (top-right) and RH (bottom-right) as a function of flight time and altitude

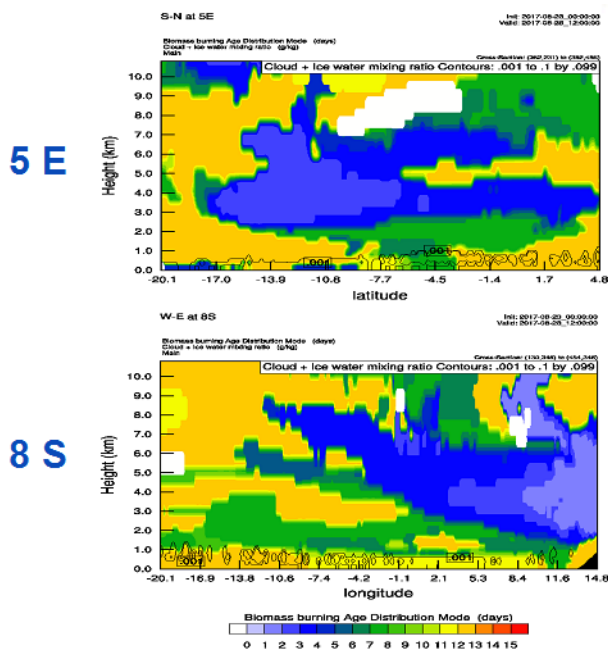


Plan B

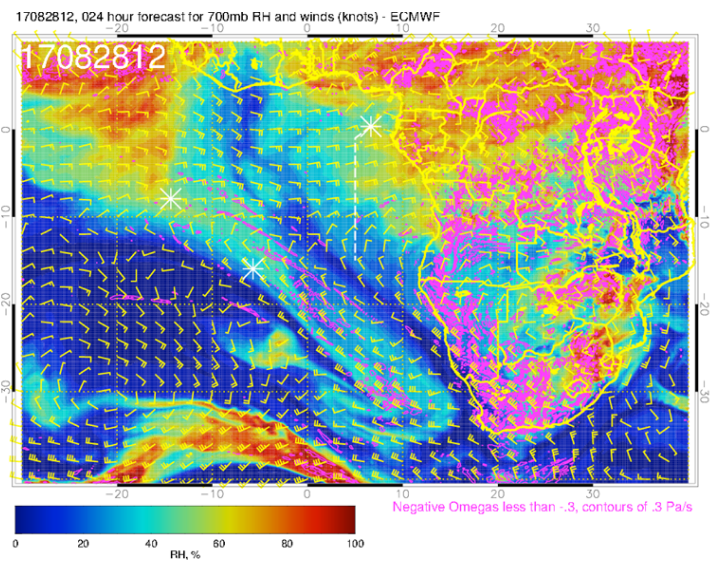
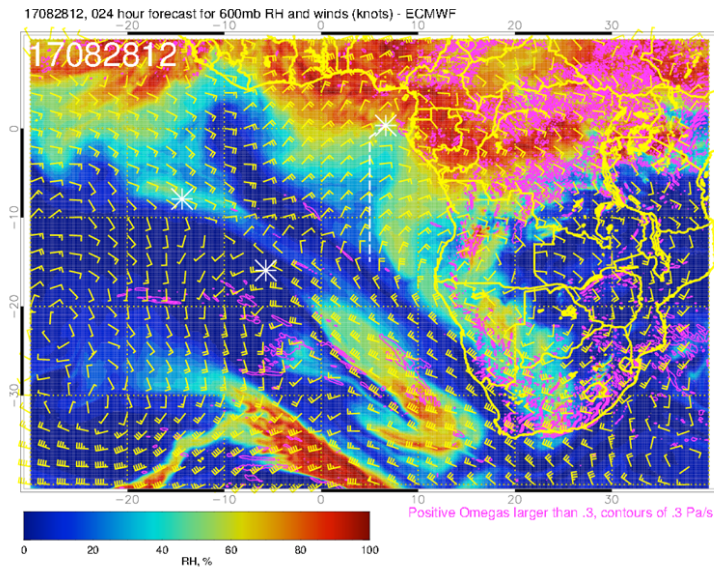
CO loading X-sec. as function of alt. and lat. (top left) and lon. (bottom-left)



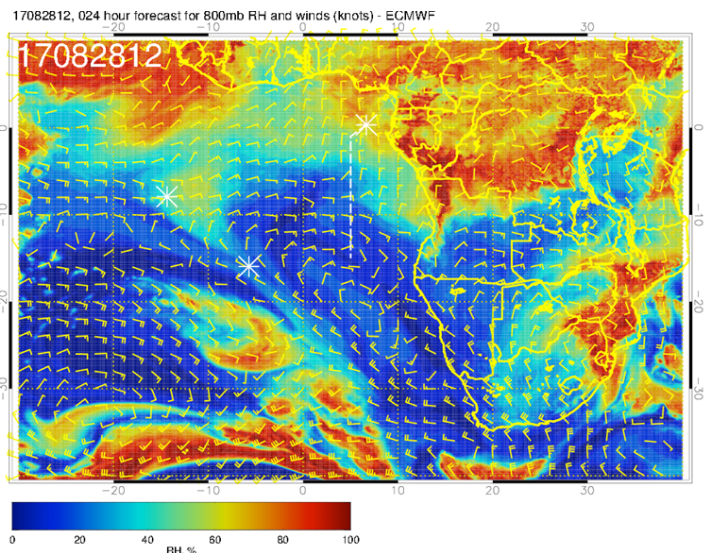
Aerosol age X-sec. as a function of alt. and lat. (top-right) and lon. (bottom-right)



Spatial RH and wind barbs for 2017-08-28

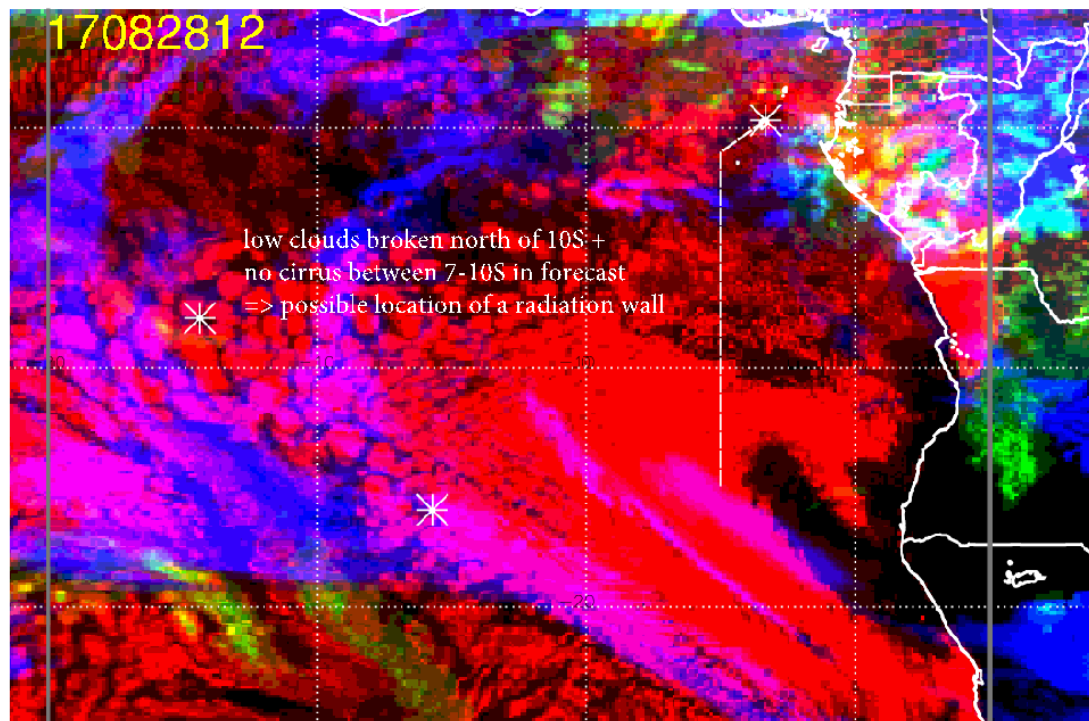


Mid level flow for Monday. At eastern edge of a dry region. All patterns are noticeably less advanced to the west than yesterday's forecast. This includes both the RH patterns in the two upper levels, and the curves in the wind patterns. Seems like we definitely want to update our trajectories.



Superposition of low/middle/high clouds from UKMO

17082812, 048 hour forecast for Cloud Fraction (low, mid, and high cloud) -- ECMWF



Low (red) + High (blue) cloud = magenta
Mid (green) + High (blue) cloud = cyan
Low (red) + Mid (green) cloud = yellow

Cloud Fraction: low (red), mid (green), high (blue) cloud

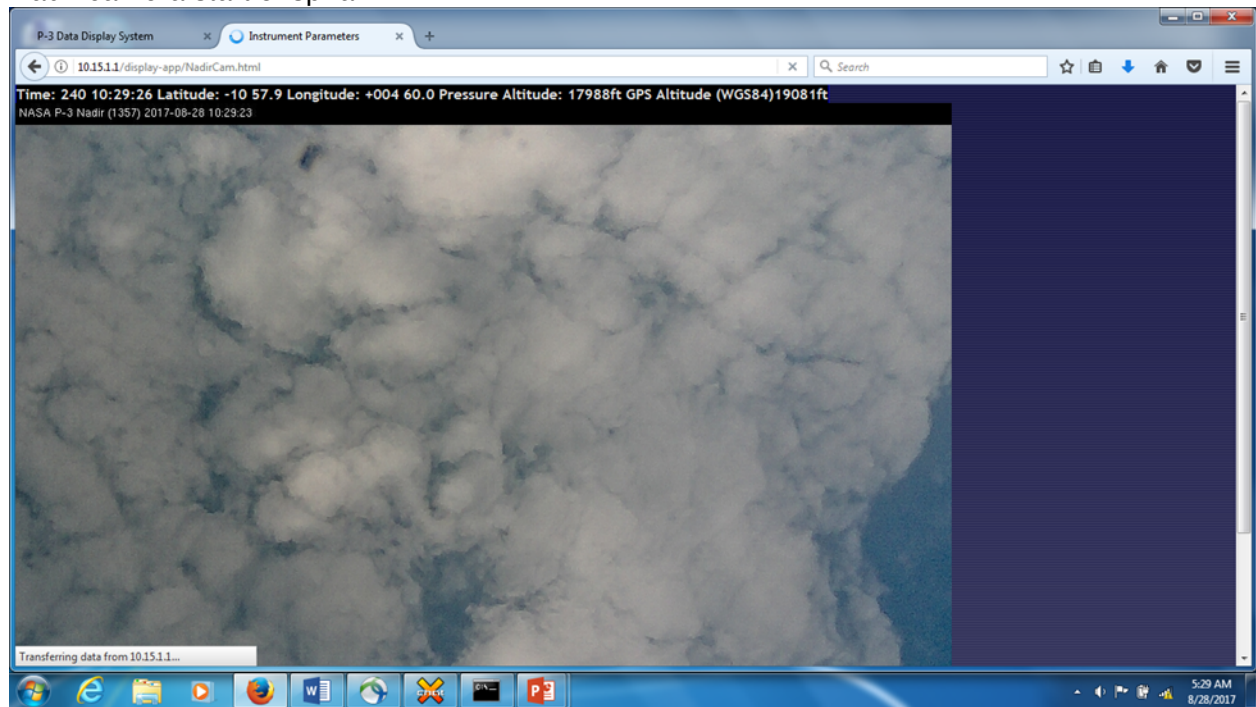
Run Table [UTC; approximate times okay, lack of detail okay. Just note major transitions, such as takeoff, time at point of furthest extent, time at beginning and end of major profiles with their detail relegated to the notes, such as spirals, level legs, straight profiling, and landing time]

description	beginning time	end time	altitude	notes
takeoff	080203	X		Altitudes are pressure unless otherwise stated
Ferry leg to 5E		0828		
Curtain to 11S	082800	103025	16,000/ 18,000	Virtually no higher cloud south of 2.4S

description	beginning time	end time	altitude	notes
Square spiral descent	103025	105050	18,000/ 200	15,100 top of plume (GPS) 12,700 (roughly) max aerosol 3,380 cloud top. No gap Variable cloud base height
Surface leg 11S to 10S	1056	111650	200 MSL	Very few breaks in cloud
Above-cloud leg 10S – 11S	112604	114243	3,800	
Dull sawtooths 11S – 8S	1147	123030	3,900/ 2,000	500 fpm climb/descent rate
Level 600 above cloud	1224	123230	4,500	
Cloud work 8S – 10.5S Level in cloud Level above cloud Sawtooth	124025 125200 125600	125000 125600 131130	-- 3,300 3,800 4,500/ 2,000	Climbed to 3,600
Aerosol leg roughly 9.5S To 4S	132635	144255	13,200/ 12,500	Changed altitude at 1333
Aerosol leg 4S – 6.5S	144700	151930	9,000	Some track adjustment at start
landing	x	170231		

visual notes: any photographs, additional images

Nadir camera start of spiral



Forward camera surface leg 1446



In aerosol plume 1415



please upload to <https://espo.nasa.gov/ORACLES/node/add/mission-science-report> when done, if access is a problem either email to bernadette.luna-1@nasa.gov to upload or ask her to grant access permission.